Effect of Land Rolling Timing on Barley Grain & Silage Yield

Objective:

To demonstrate the importance of properly timing land rolling operations as they pertain to barley grain and silage yield.

Trial Design:

- The study was conducted at Scott and Yorkton in 2023.
- Treatments consisted of land rolling timings of 1-3 days post-seed, 2-3 leaf stage, and 1st node stage and compared against an unrolled check.
- Two trials were established: 1) barley harvested for grain (AAC Synergy) and, 2) barley harvested for greenfeed (CDC Maverick).

Results:

- At both locations, rolling plots at the 1st node stage led to a reduction in plant height compared to the unrolled control (Table 1).
- At Scott, there was a significant decrease of 6 cm in grain barley and 5 cm in forage barley.
- At Yorkton, although the decrease in heights was not statistically significant, treatments resulted in a reduction of 2 cm in grain barley and 4 cm in greenfeed compared to the control.
- Grain yield was not significantly affected by rolling at either Yorkton or Scott (Table 1). However, rolling at the 1st node stage numerically decreased grain yield by 428 kg/ha (8 bu/ac) at Scott, which is substantial.
- Greenfeed yields at Scott were significantly reduced by 13% when rolled at the 1st node stage
- Greenfeed yields at Yorkton were significantly reduced by 15% and 22% when rolled at the 2-3 leaf stage and 1st node stage, respectively.
- Statistical differences between treatments for forage protein, metabolizable energy, total digestible nutrients and acid detergent fiber was not detected.
- Grain protein was reduced by 0.35% when rolling occurred at the 1st node stage at Yorkton.

Table 1. Effect of Land Rolling Timing on Barley Height and Yield at Yorkton and Scott.

Timing of Land Rolling	Harvested for Grain		Harvested for Greenfeed	
	Yorkton	Scott	Yorkton	Scott
----------Crop Height (cm)----------				
Untreated-Not Rolled	65.7	66.4 a	84.8	86.7 a
1-3 days post-seed	65.9	67.5 a	84.0	87.5 a
2-3 leaf	65.3	66.0 a	83.7	89.4 a
1st node	63.8	60.9 b	80.4	81.3 b
Lsd 0.05	NS	3.3	NS	5.0
----------Crop Yield (kg/ha)----------				
Untreated-Not Rolled	4669	5057	3925 a	7027 a
1-3 days post-seed	4676	5068	3630 ab	7225 a
2-3 leaf	4549	4971	3353 bc	7210 a
1st node	4826	4629	3098 c	6114 b
Lsd 0.05	NS	NS	464	379

Conclusion:

In this study, barley grown for either grain or forage could be rolled 1-3 days post-seed without affecting yield or quality. Rolling at the recommended 2-3 leaf stage resulted in a significant forage barley yield loss of 15% at Yorkton. However, yield or quality losses from rolling were not detected for forage barley at Scott or for grain yields at either location. There was a greater chance of reducing yield and quality when rolling was delayed to the 1st node stage. Producers who wish to roll their barley can consider 1-3 days post-seed or at the 2-3 leaf stage but should not consider rolling at the 1st node stage. In addition, rolling as the crop is emerging should also be avoided as this may damage coleoptiles and greatly affect crop development. Rolling in the heat of the day is the best practice as plants will be dry and wilted reducing the risk of damaging the crop and spreading leaf disease.

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